counting the number of cases below these points. By this process we find the following results: —

	$M = 73.8$.			$M = 74.$.			$M = 74.2$			$M = 74.4$.		
	Observation.	Theory.	Δ	Observation.	Theory.	Δ	Observation.	Theory.	Δ	Observation.	Theory.	Δ
$U - 3.0\,M$	0.0	0.2	− 0.2	0.0	0.2	− 0.2	0 0	0.2	− 0.2	0.0	0.2	− 0.2
$U - 2.5\,M$	0.0	0.8	− 0.8	0.0	0.9	− 0.9	0.0	0.9	− 0.9	0.0	0.9	− 0.9
$U - 2.0\,M$	0.9	2.9	− 2.0	1.8	3.0	− 1.2	1.8	3.1	− 1.3	1.8	3.2	− 1.4
$U - 1.5\,M$	6.4	8.2	− 1.8	7.3	8.5	− 1.2	8.2	8.7	− 0.5	9.0	8.9	+ 0.1
$U - 1.0\,M$	18.9	18.9	− 0.0	19.8	19.5	+ 0.3	19.8	20.0	− 0.2	19.8	20.3	− 0.5
$U - 0.5\,M$	36.7	35.2	+ 1 5	37.5	36.0	+ 1.5	40.2	36.5	+ 3.7	41.1	37.0	+ 4.1
U	59.0	53.9	+ 5.1	59.0	55.7	+ 3.3	59.0	56.4	+ 2 6	59.0	57.0	+ 2.0
$U + 0.5\,M$	76.8	72.6	+ 4.2	76.8	74.0	+ 2.8	76.8	74.8	+ 2.0	76.8	75.3	+ 1.5
$U + 1.0\,M$	84.0	86.3	− 2.3	85.0	87.3	− 2.3	85.9	87.8	− 1.9	85.9	88.2	− 2.3
$U + 1.5\,M$	92.9	94.6	− 1.7	92.9	95.1	− 2.2	92.9	95.4	− 2.5	92.9	95.6	− 2.7
$U + 2.0\,M$	99.1	98.3	+ 0.8	99.1	98.5	+ 0.6	99.1	98.6	+ 0.5	99.1	98.7	+ 0.4
$U + 2.5\,M$	99.1	99.6	− .5	99.1	99.6	− 0.5	99.1	99.7	− 0.6	99.1	99.7	− 0.6
$U + 3.0\,M$	100.0	99.9	− 0.1	100.0	99.9	+ 0.1	100.0	99.9	+ 0.1	100.0	99.9	+ 0.1
$\Sigma\,\Delta^2$			62.90			35.55			37.76			39.24

We find, therefore, the following series of values corresponding best to the series of observations: —

$$M = 74.0;\quad U = 1457.1;\quad \frac{c\,M}{\sqrt{2\,\pi}} = -0.057.$$

It is clear that this method gives the more satisfactory results the greater the number of observations. If the number of observations is small, a slight change in the value of M may change any single value so much, that the regularity of the series $\Sigma\,\Delta^2$ is so much affected that the point where this sum becomes a minimum cannot be determined very accurately, although it may be possible to find it very nearly by assuming a sufficiently long series of M on both sides of the probable value and applying graphical methods for finding the minimum. The differences between the average of all statures and the stature of the average child of a certain age is quite considerable. I have computed these values for the ages of 11, 12, and 13 years, of girls.

Girls:	11 years.	Stature, Average:	1370.0	$U = 1386.9$	$\Delta = +16.9$
"	12 "	" "	1446.6	1457.1	+10.5
"	13 "	" "	1494.2	1506.5	+12.3

As might have been expected, the statures during a period when the rate of growth is decreasing, are higher than the averages of all statures. This difference will continue until the adult stage is reached. It becomes also probable that the average individual does not grow as long as the tables of averages seem to indicate.

FRANZ BOAS.

Clark University, Worcester, Mass., April 25.

THE BROOKLYN INSTITUTE AND POLITICAL SCIENCE.

THE Brooklyn Institute of Arts and Sciences is an institution that has earned a national reputation for its unique and successful educational work. Founded in 1824, it began five or six years ago, under the direction of Professor Franklin W. Hooper, a career of greatly increased usefulness and influence. To-day it has nineteen hundred subscribing members, organized in twenty-five departments of work, a property valued at $250,000, and an annual income from membership fees of upward of $11,000.

The membership of the institute, while it includes a considerable number of distinguished specialists in the various departments, is largely made up of people of general culture, and of young men and women who, without being able to continue their studies in college, are intelligent and thoughtful, and interested in one or more departments of study. The largest and, considering the standing of its members in the community, the most influential of all the departments of the institute is that of political and economic science, organized in December, 1889, with Professor Richmond Mayo-Smith, the specialist in statistical science of Columbia College, as its first president.

This department has already done a most excellent work in Brooklyn, in its department meetings, its courses of lectures upon subjects in political science, and in the addresses of distinguished speakers, given under its auspices, upon occasions of wide popular interest. It is largely to the stimulating influence of this work during the last three years, that the proposition, recently made to the department, to establish a school of political science, is due. Excellent as the lectures and anniversary meetings of the department have been, the members now demand something more systematic and specialized.

The plan proposed contemplates the ultimate establishment of a fully equipped school of political science with elementary and advanced courses in civil government, political economy, social science, and history, at nominal rates for tuition. The proposition to establish such a school was enthusiastically received at the recent annual meeting of the department; the only question now is as to the proper ways and means for putting the plan into practice.

It is evident that there are grave difficulties in the way of the successful carrying out of such a project. The lack of uniformity in the acquirements of the membership of the institute, and the influences tending to interfere with a faithful attendance upon courses once begun are not so great obstacles as the difficulty of finding instructors with the qualifications requisite for this particular work. The executive committee of the department, to whom the whole matter was entrusted with power to act according to their judgment in the matter, will not be likely to move hastily. Should sufficient encouragement be offered in the way of a moderate endowment, the school may be opened in the fall, and courses in some of the above mentioned subjects offered for 1892–93.

PREPARATION FOR THE STUDY OF MEDICINE.[1]

INCOMPLETE is a discussion of this subject that does not include a consideration of the great value of an elementary knowledge of Latin and Greek.

I here most seriously disclaim any attempt to prove that devotion to Latin and Greek for the purpose of reading the literature of these languages is either requisite or even desirable as a preparation for the study of medicine. The field of modern literature and of modern science has become so vast and important that the average student will find neither time nor relative profit in the attempt to *master* the ancient classics.

I do, however, earnestly advocate the study of the rudiments — I mean simply the rudiments — of Latin and Greek, as most valuable labor-saving instruments in acquiring an English, a scientific and a medical education.

I ask indulgence, if I dwell somewhat at length on this portion of my subject, for I think we are in danger of losing sight of the many and great benefits, which every true student will receive from a judicious study of some things in

[1] Address of President E. L. Holmes Rusk, Medical College, Chicago.

these living dead languages. My argument turns on the word judicious — as applied to the extent and method of the study. The old methods, as unphilosophical as they well could be, and the undue time and labor devoted to the classics are worthy of radical change in the modern system of education.

Consider the vast array of technical terms and of common English words in our general and scientific literature, which are also pure Latin and Greek words. Look at this remarkable series of paradoxes! A young man may never have learned a single word of Latin or Greek, and yet under ordinary circumstances he has learned by hearing and reading English several hundred Latin and Greek words — if he is especially intelligent, at least three thousand. When he receives his degree of Doctor of Medicine, he has learned by the most painful toil several hundred technical terms taken from these languages — and still does not know a single word of Latin or Greek. He can count in Latin and Greek and yet is in ignorant bliss of the fact, for he could not give on demand a single numeral of these languages. He already knows the names of several colors, of several of the elements, and yet cannot tell one of them. He knows the Latin and Greek names of every member of the body, of every organ, tissue, fibre and fluid and of all their diseases, of all the senses and functions, and the words to express writing, describing and measuring. If, however, he was asked to give the Latin and Greek synonyms for any of them he could not give it.

Now for the pith of what I have to say! A rudimentary Latin, as also a Greek, grammar with the readers should be constructed for the primary object of teaching English — secondarily of teaching Latin and Greek.

The Latin grammar, save perhaps fifty connectives and other important words should contain scarcely forty pages of declensions and conjugations with only a very few rules. Every word of this grammar should be a good English word with possibly a slight change of a letter or syllable.

The Latin reader should contain at least a hundred and fifty pages of pure, even elegant Latin from classic prose and from poetry, almost every word of which would be a good English word.

We will present a few examples:

"Labor omnia vincit."

"Poeta nascitur, non fit."

"facilis descensus Averno:
Noctes atquedies patet atri janua Ditis
Sed revocare gradum superasque evadere ad auras.
Hoc opus, hic labor est."

Literae adulescentiam alunt, senectutem oblectant secundas res ornant, adversis perfugium ac solatium praebent, delectant domi, non impediunt foris, pernoctant nobiscum, peregrinantur, rusticantur."

"Homo sum, humani nihil a me alienum puto."

"Pallida Mors aequo pulsat pede pauperum taburnas Regumque turres."

These of course could be preceded by many simpler sentences, such as "Tempus fugit." "Res sacra est miser."

As the multiplication table must be committed to memory before the child can progress in arithmetic, so the few pages of declensions and conjugations must be memorized, that the beginner may become perfectly familiar with Latin terminations. With this preliminary exercise the scholar would then find no perplexities and would read almost at sight all the sentences in the reader.

In the vocabulary at the end of the reader with every principal word should be arranged all cognate words. With the definition of each word should be presented all English words derived from it.

Instead of exercises in transposing English into Latin, I would for the first year direct the energies of the pupil in the discipline of memorizing by easy tasks the classic sentences I have just described.

There seems to be a growing prejudice among educators of recent times against the practice of "learning by heart." I am convinced there is no way by which one can make more rapid progress in learning a language, either ancient or modern, than by committing to memory wisely selected sentences and phrases.

This is the natural method of learning a language. The child, from the time it attempts to utter its first syllable, never speaks that syllable perfectly till it has learned it by heart. In a single year the pupil will learn far more Latin than in two or three years by the methods usually pursued in our public schools.

The same plan should be pursued in teaching the elements of Greek. Thirty pages of grammar, each word of which should be an English word, except fifty connectives and other important words, would suffice.

There would be some difficulty in filling a Greek reader with gems of Greek, which would also be English. A competent Greek scholar, however, with the aid of fifty connective words not English, could compile a few such sentences and paraphrase others. He could arrange simple narrative of facts from history, biography, geography and mythology, in which the several hundred Greek words in our language could be formed into quite long sentences and convey much useful information.

Pardon me for reading a dry list of familiar syllables to call to your minds a multitude of Greek English words which, properly arranged, would fill many pages of instructive reading — words ending in graph, gram, meter, logue, asm, scope, sis; words commencing with dia, a or an, kata, para, apo, hypo, hyper, hydro, phos, sym or syn, phil, peri, tech, tel; words in which the following are important syllables, hepat, soma, stoma, ptoma, tony, pneuma, deme, crat, arch, bion, phon, tone, sarc.

There is a great need of such elementary text-books for the use of professional students, the preparation of which is worthy the attention of any ingenious and thorough Latin and Greek scholar. As far as I am aware, those which have been heretofore arranged do not possess vocabularies sufficiently extensive for the use of the medical student in studying technical terms. The portion devoted to grammatical forms is also inadequate. Moreover, the quotations and other sentences are not selected with reference to their elegance of expression and beauty of sentiment, which render them suitable for memorizing. Nor do they seem to be selected with special reference to the useful knowledge they convey.

The vocabulary should be sufficiently extensive to present not only all words used in our general literature, but also in the sciences. The following examples will illustrate my meaning: —

Tango, tangere, tetigi, tactum (contingo, contingere, contigi) = To touch. Tactus = Sense of touch. Tangent, tangible, intangible, tact, intact, contact, contiguous, contiguity, contingent, contingency (integer, integral ?).

σαρκαξω = To tear flesh like dogs.	Sarcasm, sarcastic.
σαρκιζω = To play.	Sarcousa, sarcosis.
σαρκικος = Fleshy.	Sarcous, sarcocele.

σαρκοφαγος = Flesh consuming. Anasarca.
σαρξ-κος = Flesh. Sarcophagus.
"κακων πε λαγος"
κακος = Bad, evil. Cacodyle — cachectic, cacexy — cacoethes, cacophony.
πελαγος = The Sea. Archipelago.

After this study of English, Latin, and Greek, the student can understand without difficulty the technical terms of every science in every modern language. He is also able to trace the derivation and meaning of new terms which are constantly formed in every department of knowledge.

He possesses the key by which he can acquire two modern languages in the time otherwise required for one; he enjoys a deeper insight into the spirit of all literature; he has a systematic knowledge of sufficient Latin and Greek to enable him to continue alone his reading of the classics if he has the time and taste so to do; he has increased and perfected the vocabulary of his own language, which, in very great degree, is a measure of mental development, and which possesses an intrinsic value almost beyond estimation.

This course is relatively easy, since the pupil makes use, through every step, of a large vocabulary which he has in great measure already at his command. After he has once learned the inflections, he makes rapid progress in comprehending the simpler forms of construction. He soon recognizes at a glance important "stems" in English words, even when they are disguised, as in microbe and autobiography, in telescope and episcopal, and in chylopoetic and poetry.

A vast majority of pupils in our high schools drop their studies at the end of their second year. They have spent so much time in struggling with an absolutely strange vocabulary and idioms that they have learned very little English and still less Latin and Greek. By the plan here advocated, they will have made progress in their own language and acquired considerable knowledge in the ancient languages — an excellent foundation for further study in any field. They will have stored their minds with many beautiful sentences, epigrams, mottoes, and gems of thought.

This course will not materially conflict with any method which a teacher may prefer.

NOTES AND NEWS.

At a meeting of the Botanical Club of Washington, held April 23, 1892, a committee was appointed to consider and report upon the questions of a botanical congress and botanical nomenclature. At a special meeting, called May 7, this committee presented a report, which was unanimously adopted by the Club, to the effect, that, while favoring the final settlement of disputed questions by means of an international congress, they do not regard the present as an opportune time, but that they recommend the reference of the question of plant nomenclature, first, to a representative body of American botanists; they suggest the consideration, by such a body, of the following questions, among others: The law of priority, An initial date for genera, An initial date for species, The principle "once a synonym always a synonym," What constitutes publication? The form of ordinal and tribal names, The method of citing authorities, Capitalization; that they recognize the Botanical Club of the A. A. A. S. as a representative body of American botanists, and commend to that body, for discussion and disposal, the subject of nomenclature as set forth in these resolutions. The report was signed by Lester F. Ward, Geo. Vasey, F. H. Knowlton, B. T. Galloway, Erwin F. Smith, Geo. B. Sudworth, Frederick V. Coville.

—M. Faure has recently invented a process of producing aluminium, according to *Engineering*, by means of which he hopes to reduce its price to about 8d. or 9d. a pound. Briefly speaking, his proposed method consists in obtaining, in a cheap manner, aluminium chloride and decomposing it electrically. This decomposition can be effected with a smaller potential difference than can that of the fluoride most frequently used for preparing aluminium by electrolysis, and at the same time a valuable bye-product is formed in the chlorine liberated. It is said, however, that there are considerable difficulties in the way of making the proposed process a commercial success.

— Opinions are being expressed by scientific workers in India, says *Nature*, in favor of the making of systematic experiments with snake poison. The Committee for the Management of the Calcutta Zoological Gardens are constructing, from private subscriptions a snake-house with the most modern improvements, which will contain specimens of all the principal poisonous snakes in the country. If the necessary funds were available, arrangements could be made to fit up a small laboratory in connection with the snake-house, for the purpose of conducting inquiries of all descriptions bearing upon the pathology of snake-bite and cognate subjects, and in future there would be no difficulty in arranging for the carrying out of any special experiments that might be required. It is understood that Dr. D. D. Cunningham, F.R.S., President of the Committee, would in that case be willing to take an active part in organizing and promoting such inquiries and carrying out such experiments, including the testing of the various alleged remedies for snake-bite, which are from time to time brought to notice.

— Captain Bower of the Indian Staff Corps has arrived at Simla from China, after a very remarkable journey across the Thibet Tableland, according to *Nature*. He had with him Dr. Thorold, a sub-surveyor, one Pathan orderly, a Hindoostani cook, six caravan drivers, and forty-seven ponies and mules. The Calcutta correspondent of the *Times*, who gives an account of the journey, says that Captain Bower, leaving Leh on June 14, crossed the Lanakma Pass on July 3, avoiding the Thibetan outpost placed further south. Journeying due east, he passed a chain of salt lakes, one of which, called Hor-Ba-Too, is probably the highest lake in the world, being 17,930 feet above the sea. Gradually working to the south-east, the explorer saw to the north a magnificent snowy range, with a lofty peak in longitude 83° and latitude 35°. After many weeks' travel over uplands exceeding 15,000 feet in height, where water was scarce and no inhabitants were to be seen, the party on Sept. 3 reached Gya-Kin-Linchin, on the northern shore of Tengri Nor Lake, in longitude 91° and latitude 31°. This is within a few marches of Lhassa, and two officials from the Devi Jong, or temporal governor of Lhassa, met him here and peremptorily ordered him to go back. But he refused to return, and a compromise was effected, guides and ponies being provided on his agreeing to make a detour to the north in order to reach the frontier of Western China. He reached Chiamdo on Dec. 31, only just succeeding in getting off the tableland before winter set in. He struck Bonvalot's route for a few miles when marching to Chiamdo. The country about this town is very fertile and well wooded. Three thousand of the monks of Chiamdo, who lived in fine monasteries, threatened to attack the party, but were deterred on learning that they carried breech-loaders. Captain Bower arrived at Tarchindo, an outpost on the Chinese frontier, on Feb. 10. The distance covered from Lanakma to Tarchindo was over 2,000 miles, all of which, save a few miles, has now been explored for the first time. The route for thirteen consecutive days lay over a tableland 17,000 feet high. Captain Bower is engaged in writing a report and completing his maps.

— "Of late years a considerable, and perhaps a disproportionate, amount of attention," says *Lancet*, "has been devoted to the scientific explanation of the state of unconsciousness. The public, as well as the professional, mind has been treated *ad nauseam* to discussions on hypnotism. The relations of trance and sleep to each other and to various phases of disease have elicited their share of logical ingenuity and of research. Quite recently again an allied condition — that of the numbed sensation consequent upon shock, such as that experienced in falling from a height — has attracted attention, though, beyond the assurances of some who have survived this experience that dread and pain are alike absent, we have no certain proof of the existence or the essential